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THE IMPACT OF HRA INFORMATION
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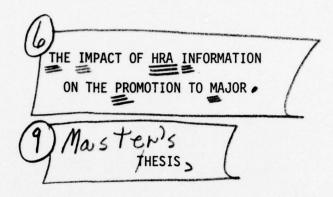
THESIS

AFIT/GSM/SM/78S-12          Harold E. Klick
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THE IMPACT OF HRA INFORMATION

ON THE PROMOTION TO MAJOR.

Master's THESIS,

Presented to the Faculty of the School of Engineering

of the Air Force Institute of Technology

Air Training Command

in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

by

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Graduate Systems Management

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## PREFACE

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Harold E. Klick

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## ABSTRACT

In this research, the *a* policy-capturing model was employed to investigate the reaction of Air Force colonels to different forms of personnel replacement information. The investigation was structured as a promotability rating decision in which each officer was asked to rate thirty-six hypothetical captains for promotion to major. These thirty-six decisions were composed of three sets of twelve decisions, identical in all aspects, but for a changing factor described as the cost of replacing a separated officer--or replacement information. The replacement information was in two forms--nonmonetary and monetary. These data forms were structured in three ways: 1) nonmonetary alone, 2) monetary alone, and 3) nonmonetary combined with monetary (redundant).

These decisions were structured into a questionnaire of a full-factorial design. In addition to replacement information two additional factors were supplied as decision cues--assignment history and education level. A group of Air Force colonels was randomly selected as test subjects, and the questionnaires were distributed by first-class mail. Data collected from these colonels were used to test research hypotheses, and the findings indicate the form of the replacement information (nonmonetary versus monetary) affects the promotability rating rendered by these officers. Also, the importance placed upon the replacement information is affected by its form, and the weight placed upon the monetary form of the replacement information is positively correlated with the highest level of assignment held by the individual. The data form of

the replacement information affects the consistency of the officer's decision making. Additionally, the findings show the officers were not successful in predicting the importance they actually placed upon each factor in completing the questionnaire. Finally the data indicated the officer's decision making policies were not homogeneous; they used a wide variety of decision policies in completing the questionnaire.

# THE IMPACT OF HRA INFORMATION
## ON THE PROMOTION TO MAJOR

## I. Introduction

The decision to promote or not to promote an individual is of concern in any organization. However, promotion decisions in the United States Air Force are especially important because all senior officers may be viewed as representing a sequence of promotions from within the organization. Private industry may choose persons from outside the organization to fill management positions, but in the military this is not possible--young officers through promotions progress to the more senior positions. Therefore in the Air Force, the decision to promote an officer is critical.

Upon promotion to the grade of major, the officer enters a grouping of senior officers known as "field grade" (major, lieutenant colonel, and colonel); these persons are the middle through the senior executives of the Air Force. The number of officers permitted in each of the field grades is specified by law; therefore, the Air Force wishes to only promote the most qualified persons to these grades.

## Costs Associated with the Promotion Process

Generally, once an officer has been selected for promotion to major, he "makes a career of the service," and he serves for a minimum of twenty years. A decision not to promote an individual to the grade of major eventually results in the person being forced to separate from the Air Force. Forced separation is a reality of the Air Force "up or

out" policy, and if an officer is forced to separate, he is entitled to severance pay. This severance pay is a cost to the Air Force associated with the decision not to promote an officer.

Persons that are forced to separate must be replaced, and this action results in additional costs to the Air Force. These "costs" are recruiting and training costs, and the lack of availability of a trained person during the time required to acquire and train a replacement. Once a replacement is trained, his level of performance may or may not be equivalent to the person he replaced because of differences in ability and experience.

Air Force officers are selected for promotion by a board composed of senior officers. Such a promotion board is provided information considered relevant for the decision making process involved. The list of information items, as presented below, is in an order that seems logical, but which in no way implies any hierarchy or precedence in the information.

Promotion board members are provided folders for each individual eligible for promotion that includes, but is not limited to, the following documents or information: officer effectiveness reports (OER's), source of commission, professional military education (PME), advanced education, active duty service commitment (ADSC), training, and awards and decorations.

The OER is a document that provides a chronological record of all the officer's assignments, a job description for each of his jobs, his performance rating for each of these jobs, and the duty and secondary Air Force specialty codes for each of his assignments. The officer's

aeronautical rating (pilot, navigator, or nonrated) and his type of commission is recorded (active duty reserve or regular).

Other information provided indicates the officer's source of commission (Air Force Academy, Reserve Officer Training Corps, Officer Training School and others), his PME (Squadron Officers' School and Air Command and Staff College), his advanced education (master's degree or doctorate degree), his ADSC (the amount of time the person must serve before he may voluntarily resign his commission--usually incurred because of special training), training (technical schools or aeronautical training) and the awards and decorations the individual has received.

The information available to a board member is voluminous, especially when one considers the number of promotion folders each board member must examine. In most instances, the board member has only minutes in which to review each candidate's folder. Of the information available, the individual board member determines what is to be considered and reviewed to make the selection decision. He uses his personal judgment to determine which facts are important or pertinent in the officer's selection folder, and, from these facts, he determines which officers to recommend for promotion.

## Human Resource Accounting Information

A new facet of accounting is being researched which is expected to aid in decision making associated with human resources such as the promotion board decisions. This measurement of the value of a human resource to an organization is known as human resource accounting (HRA).

This term has been defined by the Committee on Human Resource Accounting of the American Accounting Association as ". . . the process of identifying and measuring data about human resources and communicating this information to interested parties." (AAA Report of the Committee on Human Resource Accounting, 1973: 169) In HRA the intent is to develop measures of the value and contribution of human resources to the organization. Once these measures are developed, they may then be used as an aid in decision making.

If HRA information were developed to measure the value of Air Force officers, it could be supplied to promotion boards. The calculation could be made for each officer and these calculations would be incorporated into each officer's record. It is not envisioned such human valuation would be used as a sole criterion for promotion, but HRA data could be one additional piece of information to be considered in border-line cases--cases in which a decision had to be made between individuals with nearly equivalent records. This human valuation information could indicate to the promotion board the potential value to the Air Force if each of these officers were promoted. Or conversely, an alternate calculation might be made to indicate to the promotion board the cost to the Air Force to replace an officer if he were not selected for promotion.

In this study, senior Air Force officers (colonels) were selected as subjects because they are the individuals who serve on major's selection boards. The officers questioned were a random sample from the active duty colonels (provided by the Colonel's Group) serving in

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the Continental United States assigned directly to the Department of the Air Force. Selection criteria for the sample was designed to approximate the selection criteria used for members of a major's promotion board. That is, each colonel receiving a questionnaire meets the necessary qualifications to allow him to be selected as a member of a major's promotion board.

## Objectives of the Study

The purpose of this study is to investigate how senior Air Force officers react to two forms of human valuation information. Currently, the information supplied to a promotion board only indicates the cost of replacing an individual in a nonmonetary form. In this study, the focus is on the reaction of senior Air Force officers to conventional data (nonmonetary) versus their reaction to HRA data (monetary).

## Research Hypotheses

H1:  Senior Air Force officers will make different promotion decisions when provided HRA information in a monetary form than when provided HRA information in a nonmonetary form.

H2:  Senior Air Force officers will make different promotion decisions when provided HRA information in both a monetary and nonmonetary form (i.e., redundant information) than when provided HRA information in either solely a monetary form or solely a nonmonetary form.

H3:  Senior Air Force officers will place a greater weight upon HRA information in a monetary form than upon HRA information in a nonmonetary form in reaching promotion decisions.

H4:  Senior Air Force officers will place a greater weight upon HRA information in both a monetary and nonmonetary form (i.e., redundant information) than upon HRA information in either solely a monetary form or solely a nonmonetary form in reaching their decisions.

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## Limitations and Constraints

The decision making exercise used in this study does not attempt to simulate the promotion board process. However, this exercise may represent a special case in selection board decision making--selection of an officer or officers from a group that have equivalent records in all aspects except their cost of replacement. The decision-making factors provided to the Air Force colonels were limited. The questionnaire did not include all the information normally supplied to a promotion board. It contained a subset of the total data normally available to a promotion board because of design constraints in the decision making exercise.

This design was selected because it would provide the analytical basis to answer the objectives of the study. The exercise, a full-factorial design, permitted three promotion factors to be presented to the decision maker. The factors selected were the officer's assignment history, level of education, and replacement information. The design of the instrument, while not permitting all personnel data to be presented to the decision maker, involved the use of HRA data to differentiate between equally qualified candidates for promotion. That is, the remainder of the promotion data normally available to a promotion board were considered to be equivalent for all candidates.

## Thesis Organization and Overview

This thesis is organized into five chapters, the first of which is an introduction to the Air Force promotion process, the promotion decisions that are made, and the consequences (costs) of these promotion

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decisions. A brief introduction is made to human resource accounting (HRA) and its possible application to the Air Force officer promotion process. Chapter II follows with a literature review of HRA detailing the history and research that has been done to date in the field. In Chapter III, policy capturing and its application to decision analysis is reviewed along with a discussion of full-factorial experimental designs. A description is given of the questionnaire design used in this research, the administration of the questionnaire, and the coding of the questionnaire data. Finally the chapter concludes with an outline of the data analysis to be performed on the response data.

Chapter IV describes the results of the data analysis; these results are examined in the light of the objectives of the study to see if the research hypotheses can be supported. The final chapter presents the summary and conclusions of the thesis with a recapitulation of the significant findings.

## II. Human Resource Accounting

One of the primary roles of management and managers is the accomplishment of group and organizational goals. For an organization to continue to exist, these goals must be attained in an efficient and cost effective manner. Management has found it cannot successfully achieve this cost effectiveness and efficiency entirely through its own energy. A myriad of tools, techniques, specialties, and methodologies have been developed to aid the manager in his pursuit of these goals.

Of these disciplines available to the manager, we are concerned here with accounting. Accounting has progressed from a trade to a recognized profession (Figler, 1975: 23). As accounting has matured, techniques, procedures, and methods have evolved to meet management's requirements.

Accounting provides information to the manager to aid him in his decision making. These management decisions are of two types--those concerned with internal operation of the business, and those concerned with external functions of the business. For each type of decision making, there are supporting accounting treatments. Generally, financial accounting supports external decision making, and cost accounting supports internal decision making.

### Internal Decision Making

Internal decisions are concerned with resources--men, machines, materials, money, and time. Management attempts to utilize these resources in the most cost beneficial way. If the proper decisions, in aggregate, are not made, the enterprise will cease to exist.

## External Decision Making

Typical external interests include local and federal governments, investors, creditors, employees, and persons in the community in which the business is located. The information produced by financial accounting systems is communicated to the outside for external decision making in published financial reports.

## "Generally Accepted Accounting Principles"

The controls applied to reports that are distributed externally versus those applied to reports retained internally in an organization are the responsibility of different authorities. For a report to be acceptable for external distribution, it must conform to established GAAP standards in data preparation and arrangement.

This meeting of standards is known as complying with "generally accepted accounting principles" (GAAP). Adherence to GAAP by accountants enables interested persons to compare financial reports produced by diverse sources. The maintenance and specification of changes to GAAP is the responsibility of the Financial Accounting Standards Board (FASB). The seven member FASB has the "sole function of establishing and improving accounting concepts and standards." (Welsch, et al, 1977: 12)

Reports used for internal decision making must conform to standards, but these standards are determined by each organization rather than some external body. For internal reporting, the fact that the procedure is useful is sufficient justification for its existence.

The development of new accounting procedures for external reporting purposes follows the same rationale as for internal--usefulness.

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But, developing a new external accounting procedure is very difficult because of diverse interests in the groups involved--the Government, labor, investors (both present and potential owners), investment analysts, creditors, and the public at large.

## Traditional Accounting Information Content

The information that decision makers traditionally receive from an accounting system includes measures of the physical and financial resources of the organization; however, relatively little is said about the organization's human resources (Brummet, et al., 1969: 12). This lack of information concerning human resources has led to an interest in the development of techniques, procedures, and methods for valuing an organization's human resources. But, before we discuss these new developments, we will examine the traditional accounting treatment for capital assets and human assets.

## Accounting for Capital Assets

Capital assets are entered into the accounts at an amount equal to the actual purchase price plus any additional one-time costs necessary to prepare the item for operation. These costs would include transportation, installation, and special modifications to the existing structures to accommodate the item. This total amount paid is considered to be its acquisition cost.

Costs associated with the operation of an asset are charged as an operating expense in the period in which these charges accrue. An additional expense is the devaluation of the asset because of its use; an estimated amount is charged to each accounting period as an expense to reflect the decline in the value of the asset due to use.

## Accounting for Human Assets

The accounting treatment typically used with human resources does not formally ascribe any value to individuals. That is, no value is entered into the accounts for human resources. All cost associated with human resources--recruiting, selecting, hiring, training, placing, and developing the employees of the firm--are treated as current operating expenses (AAA Committee on Human Resource Accounting, 1973: 171).

## Human Resource Accounting

The area of human resource measurement has been given the name human resource accounting (HRA). Initial work in this area was done by Rensis Likert, a behavioral scientist (Paperman, 1977: 42). Likert believed managers have a tendency to look at short-term gains as an avenue for progression through the organization, and to support this progression, managers tend to develop an authoritarian style of management. The short-term effects of such a style are to enhance organizational performance, thereby improving the measures used in management promotion decisions.

Generally, managers who are autocratic are rewarded in the short-term through promotions, which, in turn, reinforces their autocratic style of management. Behavioral research has demonstrated the long-term effects of an autocratic environment are a degradation of human attitudes, motivations, and innovation. Likert believes management is aware of such consequences, but will continue this practice until adequate measures are developed to report the accompanying decline in the value of the human resources (Paperman, 1977: 42).

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As envisioned by Likert, a system would have to measure the attitudes of the employees and the socio-psychological climate within the organization. These measurements, taken periodically, would indicate the attitudes and psychological health of the human resources. Any fluctuations in measures would indicate a change in the socio-psychological climate. Such a system has yet to be developed. Likert estimates it would take "from five to ten years and many millions dollars worth of work to collect the data and to make the computations required before human asset accounting can become fully operational." (Paperman, 1977: 42-43) For additional information describing Likert's work and his socio-psychological model, refer to an article in Personnel (Likert, 1973) and Human Resource Accounting by Flamholtz (1974: 113-134).

## Purpose of Human Resource Accounting

The purpose of human resource accounting is to improve the quality of the financial decisions made both internally and externally to the organization by supplying all interested parties with measures of human resources in an organization (AAA Report of the Committee on Human Resource Accounting, 1973: 169). The philosophy of this approach was outlined by the American Accounting Association's Committee on Human Resource Accounting (1973: 170). The committee identified three major objectives of HRA:

> Measurement: The development of models for measuring the cost and value of people to organizations (including monetary and nonmonetary measures).
>
> Applications: The development of operational HRA systems in a number of actual organizations.
>
> Cognitive and Behavioral Impact: To determine the impact of HRA on human attitudes and behavior.

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Measurement Research. Measurement research has been of primary interest to the academic accounting community. The details of this research are voluminous, and the reader is directed to an article by Grove, et al., (1977) for a detailed discussion. A bibliography listing most of the research documents in the area of measurement development for HRA accompanies this article.

In this chapter, an introduction to HRA measurement will suffice. Two basic types of HRA models have been proposed: input models and output models. Examples of the input models are the acquisition cost systems (analogous to the treatment for assets currently in use), replacement cost systems, discounted wage flows, and dollarized attitudes. For the output models, there are opportunity cost systems, market value, discounted earnings flow, economic value, and group value models. The last model, the group value model, is the system proposed by Rensis Likert.

There is great variety in the emphasis of each of these models, but each method offers a slightly different insight into human resource valuation. As examples, the replacement cost model concentrates on those costs associated with replacing an individual with a person of equivalent talent and experience. The acquisition cost model measures the same items, but the former concentrates on the current costs of replacing a person while the latter is concerned with historical costs.

Applications Research. The pioneering effort in HRA at the R. G. Barry Corporation of Columbus, Ohio, was started in October 1966 by three persons--R. Lee Brummet, Eric G. Flamholtz, and William C. Pyle-- going operational on January 1, 1968. In 1967 R. G. Barry Annual Report,

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the following description was given for the system, "This effort is just the first step in the development of a sophisticated measurement and accounting procedures that will enable us to report accurate estimates of the human assets of the organization." (Brummet, et al., 1969: 12).

The system was designed, as has been acknowledged by Brummet and his associates, for internal management usage. Even though Barry Annual Reports beginning in 1969 and continuing through 1973 did report pro forma HRA financial statements, the company acknowledged that they did not consider the information to be in compliance with GAAP as is required by financial accounting standards. The most common application at Barry, as described by R. L. Woodruff, Jr., vice-president of Human Resources and Management Services for R. G. Barry, involved a form of monetarized reporting of personnel turnover. Research reports were limited, and as of 1974, the HRA system at Barry was discontinued "because of additional resources necessary to make it a useful management tool." (Paperman, 1977: 44-46)

A second research application of HRA is the "force-loss" project at American Telephone and Telegraph (AT&T). This system was initiated in 1971; it was designed to determine the cost of telephone-operator turnover (Weiss, 1975: 37) thereby improving managerial effectiveness in the development and retraining employees. Its methodology was to "treat employee-replacement cost (hiring, training, benefits, etc.) as if they were capital investments rather than operating expense, and hold managers directly accountable for those segments of the investment that fall within their area of responsibility." (AAA Report of the Committee on Human Resource Accounting, 1973: 178)

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According to an unpublished AT&T report issued in February 1974, Force-Loss Cost Analysis, H. W. Gustafson described the approach taken and the difficulties encountered. One of the most difficult concepts to comprehend was the nature of human resources and their accounting treatment. Assets are typically recorded at a value equal to their acquisition cost, which in itself is difficult to measure with respect to human resources, but the real problem occurred when attempts were made to calculate and reconcile the expected economic contribution of human assets with the economic contribution expected of "regular" assets. Economic contribution of human resources are expected to increase as an employee gains experience and familiarity with the job. Exactly the opposite is expected from conventional assets ; as a machine wears, its economic contribution is expected to decrease because of reduced production due to wear and down-time for maintenance.

In human resources acquisition cost, assuming it can be measured, is decreased period by period due to amortization, but the individual's expected economic contribution to the organization increases period by period. This difference in the nature of conventional assets and human resources is the source of the confusion and problems described by Gustafson. He indicates efforts to implement the "force-loss" system were held in abeyance because of unresolved issues involving the determination of costs, allocation of costs, amortization of costs, and training of supervisors to use the data (Paperman, 1977: 46-47).

Finally, there have been a number of research application efforts involving an insurance company (Flamholtz, 1974: 84), and a certified

public accountant firm (AAA Committee on Accounting for Human Resources, 1974: 179, 115). The published documentation and results of these HRA efforts have been limited.

Behavioral-Impact Research. Relatively little research has investigated the impact of HRA information upon the attitudes and behavior of persons associated with HRA systems. The HRA applications described above have produced little behavioral data; they have only demonstrated that HRA systems can be established (Rhode, 1976: 22).

To date, six empirical studies have investigated the behavioral impact of HRA data. The first three efforts and the last examined the impact of human resource cost on external decision makers. The fourth and fifth studies were concerned with internal decision making. First, a study was performed by Elias as a laboratory experiment investigating the effects of human outlay costs upon stock investment decisions. The subjects (CPAs, CFAs, and accounting students) were supplied information about firms (Tomassini, 1977: 906). Some of this information included HRA data and some did not. The results indicated the inclusion of HRA information did effect the decisions of certain groups of subjects, but not all groups. The strength of the relationships among the variables, while statistically significant, was not very strong. An attempt to identify the results with test subject demographic data (background, variables such as education, experience, age, sex, etc.) was not successful (AAA Report of the Committee on Accounting for Human Resources, 1974: 180).

Second, Hendricks simulated investors (accounting and finance students were used as subjects) making two stock investment/capital

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allocation decisions, one with and one without HRA cost data. The differences in the two decisions were statistically significant; Hendricks was able to find a significant correlation between the decision difference measures and the subject's age and work experience, but he was unable to establish a significant correlation with remaining demographic variables (Tomassini, 1977: 906).

Third, Schwan considered the effects of human resource cost measures on bankers' decisions. The presence or absence of HRA data in hypothetical financial statements was found to have a statistically significant impact upon estimates of management's ability to meet challenges and opportunities. These results were significant with respect to predictions of the firms' net income (Tomassini, 1977: 906).

The fourth investigation, concerned with internal decision making, Tomassini (1977) collected evidence about the differential effects of quantitative (monetary) versus qualitative (nonmonetary) information on decision making. The subjects for this study (upper division and graduate accounting majors) were asked to make a personnel layoff decision. Data for the decision making exercise was supplied in two forms--conventional accounting data and conventional accounting data plus HRA data. Conventional accounting data was composed of estimated cost savings as a result of payroll reduction due to layoff and the following narrative written by the "personnel manager:"

> "A layoff will hurt us in the long run more than it will help us now. We have built a good organization, but a layoff will hurt morale. In addition, we need these people around in August; but by that time, these people will have found jobs elsewhere, and we won't be able to get them back. If we have to recruit, hire, and train replacements for many people who do not return, we will have to incur substantial costs."

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This conventional data was supplied to the control group. The experimental group received this same information, but, in addition, they also received the data listed in Table 2.1.

| Table 2.1 | | | |
|---|---|---|---|
| Personnel Manager's Estimates of Rehiring and Replacement Costs | | | |
| Layoff Period | Estimated Rehiring Costs | Estimated Cost of Replacement | Estimated Total Cost |
| 3 Weeks | $ 26,000 | $140,800 | $166,800 |
| 6 Weeks | $ 22,500 | $257,100 | $279,600 |
| 12 Weeks | $ 20,000 | $291,900 | $311,900 |

Experimental results indicated "managers" would reach a statistically different decision when HRA data were available.

Fifth, Flamholtz examined the impact of human resource value (HRV) on a personnal allocation decision. Thirty-five practicing CPAs were selected as subjects, and the results indicated significantly different decisions were made by those CPAs who used traditional trait evaluations relative to those who used two types of HRV data (Tomassini, 1977: 906-907).

The last study, conducted by Fleming (1977), investigated the behavioral implications of the publication of human asset data in financial reports. For subjects, Fleming selected thirty-nine accounting students and twenty-one faculty members. The presentation of the questionnaire results, while not described as being statistically significant did provide behavioral insights into the use of HRA measurement systems and the reporting of the data. Fourteen questions were presented to all persons; each

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question was to be answered on a seven-point scale running from "Strongest Disagreement" to "Strongest Agreement." Students were asked three additional questions related to potential work position, and faculty was to respond to five questions concerning their present positions.

As an example of the results, forty-three percent of the faculty and thirty-eight percent of the students did not agree (strongly or somewhat) with the statement, "Placing a dollar value on human beings is an insult to their dignity," but an almost equal percentage of the faculty felt that it was not only an insult, it was treating people as slaves or machines. Additional questions were asked concerning the value of the individual and disclosure of that value.

This survey did not establish any specific position or answer explicit questions. The results were inconsistent and inconclusive, but it did indicate areas of interest. As the author points out,

> "It is important that management be cognizant of one very
> important fact before attempting to classify human beings
> as assets--they will be the first asset who can talk back,
> walk out, or deliberately reduce their output."

These six studies have been concerned with the empirical evidence of the behavioral impact of HRA. Again, the first three and the last studies address external decision making, while the fourth and fifth examine internal decisions. In the first, second, and fourth studies results were acquired using students and other non-professional decision makers. Several authors have written about possible problems in using surrogate decision makers in accounting research; however, Tomassini (1977: 907) points out that more empirical data should be acquired before one assumes that actual decision makers will make different decisions from those of students.

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## The Future of HRA

To date, research in HRA has concentrated on the development of human resource measures, an area primarily the concern of academic accountants. Extensive research has been conducted and substantial progress has been made in the development of frameworks for measuring human resources.

Immediate Emphasis. The current emphasis in HRA suggested by the American Accounting Association's Committee on Human Resource Accounting is to identify the decisions involved in human resource management and to examine the impact of these decisions on the organization. The committee states, "Research is required to demonstrate both the feasibility of human resource accounting and its effects on attitudes and behavior." Without a demonstration, the attractiveness of current theoretical arguments for HRA may soon lose their glamour and business will view HRA as an exercise of interest only to academic accountants and behavioral scientists (AAA Committee on Accounting for Human Resources, 1974: 124; Rhode, 1976: 13).

HRA Implementation. Much of the HRA literature expects and encourages the first implementation of HRA systems to be in an internal decision making context. Internal reporting does not require support of external interests or regulatory bodies. Through an internal decision making effort, the usefulness of HRA can be demonstrated (Figler, 1975: 23; AAA Report of the Committee on Human Resource Accounting, 1973: 170).

## Summary

This chapter has discussed the importance of information for decision making. Contrasts were presented comparing internal and external

decision making in an organization. The primary source of data for making organizational decisions is reports developed by accounting systems. Accounting attempts to measure the performance of an organization, and the resulting data is used internal and external to the business.

For the information to be understood it must be consistent. The methods for calculating and the form for reporting the information must be the same, time period after time period, if there is to be comparability. Without comparability, decision makers would have little basis by which to determine if a past decision had a beneficial or adverse effect.

The traditional accounting treatments for assets and the costs associated with human resources were discussed, and the expected effects from these treatments. Generally management is viewed as a group trying to maximize their personal gain and wealth. To do this, management will tend to make decisions that improve the measures being used to gauge their performance. Because of the possible adverse behavioral effects, an emphasis has been made in recent years toward valuing the human resources in the organization. It is believed, if human resource data is reported, management will be more aware of the value of their employees, and, additionally, controls can be applied to prevent managers from depleting the organization's human resources.

The remainder of the chapter examined the research in human resource accounting (HRA). Which, to date, has been theoretical with little empirical data reported in the literature. The emphasis suggested by HRA authors is to conduct empirical research and report the results, for without a demonstration of its usefulness, HRA may remain an area only of academic interest.

# III.  Research Methodology

The purpose of this research is to analyze the decisions made by Air Force senior officers, and determine if the form of the information significantly affects their decisions.  In order to measure these effects, a decision-making exercise was designed which presented thirty-six hypothetical Air Force captains to be rated for promotion on a scale of one to nine.

## Policy Capturing

The primary concern of this research is to relate the decision of a judge (or judges) to the information which prompted that decision.  This analysis assumes a judge's decisions are based upon a linear combination of the available information cues. This class of decision-making process can be described by a linear regression model as suggested by Hoffman (1960) which is based, in turn, upon Brunswiks's lens model (Slovic, et al., 1971: 655).  Through the use of multiple linear regression analysis, a researcher can determine the subjects utilization of decision cues and the relative importance he placed upon each of these cues.  This analytical ability to determine an individual's decision-making policy is known as judgment modeling or policy capturing.  Policy capturing is a widely used technique to investigate the areas of human judgment and decision making.  It has been used in areas of accounting (Ashton, 1974; Boatsman and Robertson, 1974), managerial decision making (Harrell, 1977, O'Berry, 1977; Glenn, 1977), and promotion selection (Christal, 1968).

There has been much controversy in the literature about linear versus nonlinear decision making.  The question one must first answer is

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the process being studied--the decision or the decision making. Research has demonstrated the success of the linear model in making "correct" decisions, even decisions reached by nonlinear means. Unless one is examining the subject's decision-making process, the linear model has been proven successful in decision modeling. For more detailed description of this research refer to Slovic, et al. (1977: 11-12).

The analytical technique used in examining these models is multivariate linear regression analysis. The response of the decision maker is entered as the criterion (dependent) variable, and the cues or information upon which he based his decisions are the predictor (independent) variables. The results of the multiple linear regression analysis is a multi-variable equation that has been "fitted" to the data by a least-squares mathematical process. Once derived for a given configuration of cues, this model will supply an estimate of the criterion variable. The ability of the derived equation to predict the subject's response is termed the goodness of fit which is measured by the square of the multiple correlation coefficient, $R^2$. The $R^2$ is a measure of the variation in the dependent variable explained by the fitted line relative to the total variation of the dependent variable. The larger the $R^2$ value, the better the derived regression equation fits the data. The range of $R^2$ is from zero to one, where one implies perfect predictive ability.

The linear model describing this relationship is of the following form:

$$Y = b_0 + b_1 X_1 + \ldots + b_n X_n + \varepsilon$$

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where Y is the criterion variable, $X_1$ through $X_n$ are the n predictor variables, and the error term, $\epsilon$, accounts for any variance in Y not explained by the predictor variables. The $b_0$ value in the equation is the Y-intercept of the equation. If all of the variables are standard-ized, the $b_0$ term disappears and the equation becomes

$$Y_s = B_1 X_{1s} + B_2 X_{2s} + \ldots + B_n X_{ns} + \epsilon$$

and the $B_1$ through $B_n$ are called the standardized regression coefficients or beta weights.

If the design of the questionnaire is one in which there are no intercorrelations between the predictor variables, then the cues are said to be orthogonal. Under these special conditions of orthogonality, a quan-tity may be calculated as proposed by Hoffman (1960) that measures the relative importance placed upon that cue. The formula for calculating the relative importance is as follows:

$$W_i = \frac{B_i^2}{R^2}$$

where

$W_i$ = relative importance associated with the ith predictor (independent variable or cue) variable.

$B_i$ = standardized regression coefficient for the ith predictor variable.

$R^2$ = squared multiple correlation coefficient of the model.

The sum of the relative importance values is equal to one; alternately, the sum of the squared standardized beta weights equals $R^2$ (Slovic, et al., 1971: 658).

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## Full-Factorial Experimental Designs

One method to ensure the predictor variables are orthogonal is to design a questionnaire in which all possible combinations of the cues are presented. Such a design is known as a full-factorial design. There are possible difficulties in such designs; the most common encountered are dysfunctional reactions to combinations of cues that are impossible or unrealistic to the situation portrayed. In this questionnaire, there was no difficulty--all possible combinations of the selected cues were realistic (Slovic, et al., 1971: 658-659).

## Design of the Decision-Making Exercise

The purpose of the decision-making exercise was to investigate how senior Air Force officers react to two different forms of information-- monetary versus nonmonetary.

The four research hypotheses were related to the belief these officers would 1) make different decisions when exposed to the two forms of data (hypothesis one and two), and 2) they would place more weight upon the monetary than the nonmonetary form (hypothesis three and four). In order to have an analytical basis to test these hypotheses, a full-factorial design was chosen for the questionnaire.

While the intent of the instrument was to answer hypotheses about monetary versus nonmonetary data forms, additional cues were added to the design to make the instrument more realistic. The number of cues presented had to be limited to keep the number of decisions reasonable. The cues selected were aeronautical rating and PME (both of which are dummy cues-- held constant), assignment history (two levels of variation), education level (two levels of variation), and replacement information (three types

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of cues, each with three levels of variation). With these selected cues, a total of thirty-six promotability decisions were made by each decision maker. The decision-making context involved rating the promotability of equally qualified captains to the grade of major. An abbreviated sample of the decision-making exercise is included in Appendix A.

The replacement information cues were of three types; each indicated the "cost" of replacing a captain if he were not promoted to major. These information cues were months of training (nonmonetary), dollars cost to train (monetary), and a combined form of months and dollars cost to train (redundant). The first type is similar to information that is presently available to promotion boards--active duty service commitment. While the type of replacement information cues were different, identical information was presented in the remaining cues.

Each individual made three types of decisions, i.e., replacement information in the nonmonetary, monetary, and redundant forms were presented. These decisions were randomized to ensure no cross contamination or bias in the data cue forms. The inclusion of all three types of replacement data in one questionnaire was chosen so each person would serve as his own control. If three different decision makers had been asked to make decisions, each seeing only one type of the replacement data, the results would have been obscured by any unequal tendencies for judges to rate high or to rate low. With a single individual making all three types of decisions, direct comparisons of the importance placed upon information may be made.

## Collection of Data

The subjects of this study were Air Force colonels in the Continental United States assigned directly to the Department of the Air Force. This grouping of persons was selected in an effort to capture the decisions of active, working Air Force decision makers; decision makers that theoretically could be members of an Air Force promotion board. These officers were chosen in order to employ actual rather than surrogate decision makers. The group questioned was selected by the same criteria used in the selection of promotion board members from the Air Force colonel population. The survey was distributed and returned by first-class mail.

## Coding of Collected Data

Upon receipt of the data, it was keypunched into standard computer cards and entered into the Aeronautical Systems Division (ASD) CDC 6600 computer at Wright-Patterson Air Force Base, Ohio. The computer analysis included special purpose FORTRAN programs and the Statistical Package for the Social Sciences, commonly called SPSS (Nie, et al., 1975). The FORTRAN programs were used for data manipulation and calculation of the individual regression equations. The SPSS system was used to calculate the overall regression equations and answer the research hypotheses.

## Data Analysis

The following sections describe the analysis of the exercise data. Generally the promotability decisions were modeled through the use of multivariate regression analysis and multivariate analysis of variance (MANOVA). Additional analyses were performed to test specific research hypotheses concerning the three forms of replacement information.

Descriptive Statistics. The first analysis performed a one-way frequency distributions of the demographic data using the SPSS "Frequencies" routine. The output of this program lists each category of the demographic data and the number of respondents in each of these categories. A copy of these results is included in Appendix B.

Group Regression Analysis. The SPSS regression program was used to calculate regression equations for the data. In all cases, the promotability decision (criterion variable) was regressed with the promotion factors $X_1$ through $X_3$ (predictor variables). Group regression calculations were run on the following groups:

Run 1: All types of replacement information combined.
Run 2: Nonmonetary type of replacement information.
Run 3: Monetary type of replacement information.
Run 4: Redundant type of replacement information.

The output of the SPSS regression program provided the following information: 1) the group $R^2$ for each run, 2) the standardized regression coefficients (beta weights), and 3) the F-test level of significance for each promotion factor.

Individual Regression Analysis. Regression analysis for each decision maker was accomplished with a program written by the researcher. Individual regression equations were calculated for: 1) all decisions, 2) decisions made with nonmonetary replacement information, 3) decisions made with monetary replacement information, and 4) decisions made with redundant replacement information. The output of the program was 1) the standardized regression coefficients, 2) relative importance, 3) $R^2$ value, and 4) the F-value of the significance of the model. These resulting data were used in additional analysis with SPSS.

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<u>Multivariate Analysis of Variance (MANOVA)</u>. Multivariate ANOVA was used to determine if there was a significant reaction by the decision makers to the three different forms of replacement data. The MANOVA runs were as follows:

Run 1: Nonmonetary and monetary types together.
Run 2: Nonmonetary and redundant types together.
Run 3: Monetary and redundant types together.

The output of the MANOVA program will indicate the level of significance associated with the hypothesis that different decisions were made.

<u>Pearson Correlation</u>. The Pearson correlation program in SPSS will be used to examine relationships between the monetary form of the replacement information and the demographic data. The results of this program will indicate if there is a positive or negative correlation between the variables and the level of significance.

<u>Paired Samples t-Test</u>. The paired samples t-test will be used in conjunction with the MANOVA results to test the third and fourth research hypotheses--determining if more weight was placed upon the monetary and redundant types of replacement information. This t-test compares observations that are paired; for the standardized beta weights, two weights on the same cue--replacement information--will be compared. Pairing exists because each person made decisions with three replacement data types. The paired samples t-test is a subprogram of SPSS.

<u>Subjective/Objective Importance</u>. The final task in the exercise for each decision maker was to indicate the relative importance he believed he placed upon each of the three promotion factors by distributing 100 points

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to them.  Each person, in this way, was asked to indicate their decision

policy.  These individual weights will be referred to as subjective

importance, and the relative importance determined by regression analysis,

$W_i$, will be referred to as objective importance.  Runs will be made for

the three types of replacement data grouped, and for each type of the re-

placement information individually.  MANOVA will be used to determine if

the individuals were able to successfully predict their decision policies

used in completing the exercise.  The subprogram MANOVA is available

through SPSS.

## $R^2$ as a Measure of Consistency

If an instrument is an orthogonal design, that is, all possible

combinations of the cues are presented, the predictor variables are un-

correlated and the quantity $R^2$ can be interpreted as a measure of the con-

sistency of the judge in applying a decision policy.  In this particular

design, three different types of replacement information were supplied to

each judge.  A $R^2$ value can be calculated for all decisions considered to-

gether, and three additional values of $R^2$ may be calculated for each type

of replacement data.

This measure of consistency is applicable only to each individual

decision maker.  If an attempt is made to extend this concept for all deci-

sion makers in an overall model the consistency measure is not so clear for

two reasons:  1) a greater number of random errors is introduced in larger

groups and 2) each judge may be very consistent in applying his individual

policy, but the composite group may not reflect the same degree of con-

sistency as the individual judge (O'Berry, 1977: 40).

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## Summary

This chapter has outlined the research methodology utilized in this study. The overall approach was to design a decision-making exercise requiring an individual to evaluate the promotability of thirty-six hypothetical Air Force captains. To analyze the results, policy capturing techniques will be applied to the data.

The basic design of the decision exercise conforms to a full-factorial experimental design which ensures the promotion factors for the decisions are orthogonal. In order to limit the number of decisions to be made, three promotional factors were included in the exercise. The three factors are 1) assignment history (two levels), 2) level of education (two levels), and 3) replacement information (three levels by three types).

The questionnaire was administered by first-class mail to active duty Air Force colonels randomly selected from the Continental United States based Department of the Air Force colonels. Through the use of MANOVA it was possible to determine if the type of the replacement information affected the decisions of these officers. Linear multivariate regression analysis made it possible to calculate the weight placed upon each type of replacement information, and a paired t-test made it possible to compare these weights to determine if one type were weighted more than another.

Additional analyses were discussed which allowed the examination of the relationship between replacement information and demographic data. Finally, techniques were described to allow relationships between objective and subjective importance measures to be examined.

# IV. Results

The purpose of this chapter is to present the analysis of the data acquired through questionnaires. These data shall be analyzed according to the methods outlined in the previous chapter, and the following will be presented: 1) questionnaire response rates, 2) testing of research hypotheses, 3) correlation of results with demographic data, 4) average importance placed upon cues, 5) consistency of the decision makers, and 6) comparison of subjective and objective importance measures.

## Response Rates

A total of 301 questionnaires were distributed to Air Force colonels by first-class mail. Of this initial number, 172 were returned and 166 were usable with a resulting response rate of 57 percent. The participants were offered the opportunity to receive information describing their performance on the questionnaire. Of the 172 questionnaires returned, 142 officers desired feedback or a rate of 83 percent.

## Hypothesis Testing

The purpose of this thesis was to investigate how senior Air Force officers react to different forms of human valuation information. The first and second hypotheses state senior Air Force officers, when supplied different forms of replacement costs, will make statistically different decisions. In order to determine if the form of the replacement data significantly affected the decisions a MANOVA analysis was run. This analysis compared the three sets of responses made by each individual; the results of that analysis are presented in Table 4.1. Two of the three replacement data analyses indicate statistically different decisions were made.

Table 4.1

MANOVA Comparing Decision Differences
Between Replacement Information Types
(Level of Significance .05)

| Replacement Information Type | Statistically Different Decision Made? |
|---|---|
| Nonmonetary Monetary | Yes |
| Nonmonetary Redundant | No |
| Monetary Redundant | Yes |

The third and fourth hypothesis addressed the weight placed upon the different replacement data types. To test these hypotheses, the paired t-test procedure in SPSS was used to compare the standardized beta weights (standardized regression equation coefficients) for each type of replacement information. The standardized beta weights were calculated by a FORTRAN program which fit a regression equation to each of the three decision types.

The results of the t-test are presented in Table 4.2; they indicate the test subjects placed greater weight on the monetary and the redundant types of data. The differences in these weights were statistically significant in two of the three comparisons.

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Table 4.2

Paired t-Test of Significance Comparing
Standardized Beta Weights between Replacement
Information Types
(Level of Significance .05)

| Replacement Information Type | Mean Standardized Beta Weight | Statistically Different Weight? |
|---|---|---|
| Nonmonetary | .3010 | Yes |
| Monetary | .3492 | |
| Nonmonetary | .3010 | Yes |
| Redundant | .3611 | |
| Monetary | .3492 | No |
| Redundant | .3611 | |

## Data Correlations

Utilizing the Pearson Correlation program in SPSS, data correlations were run to see if the data exhibited a relationship between the weight placed upon the monetary replacement data and the demographic data. The results are displayed in Table 4.3; they indicate a positive correlation with the individual's highest level of assignment; additionally the officer's training and experience in accounting, financial management, cost analysis, or economic analysis are positively related. Of these relationships, the former is significant at the .05 level and the latter is significant at .08. The remaining demographic categories, education level and maximum number of people supervised, suggest a negative relationship.

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| | | Table 4.3 | | |
|---|---|---|---|---|
| | | Correlation of Monetary | | |
| | | Replacement Information with Demographics | | |
| | | (+ Implies a Positive Correlation) | | |
| Highest Assignment Level | Education Level | Maximum Number Supervised | Cost Analysis Education | Cost Analysis Experience |
| +* | - | - | + | +** |

\*    Significance Level .05
\*\* Significance Level .08

## Importance of Factors

The Hoffman relative weight, as presented in Chapter III, is one measure of the relative importance placed upon a factor by the decision maker. The average importance placed upon each predictor variable associated with the type of the replacement information is presented in Table 4.4. As an example, for the nonmonetary replacement information, these results indicate 37 percent, 40 percent, and 22 percent of a possible 100 percent importance was placed upon assignment history, formal education, and replacement information, respectively. Of the officers questioned, more emphasis was placed upon replacement information when it was presented as a monetary or a redundant type than when the same data was presented as a nonmonetary type.

| Table 4.4 | | | |
| --- | --- | --- | --- |
| Average Importance Placed Upon<br>Each Promotion Factor | | | |
| Replacement<br>Information<br>Type | Assignment<br>History | Formal<br>Education | Replacement<br>Information |
| Nonmonetary | .3744 | .4026 | .2231 |
| Monetary | .3756 | .3845 | .2398 |
| Redundant | .3523 | .3671 | .2806 |

## Decision Maker Consistency

The multiple correlation coefficient, $R^2$, for orthogonal question-naires may be viewed as a measure of the individual's consistency in applying a decision policy. In Table 4.5, a comparison is presented of the average $R^2$ values for the decision makers. The consistency of these officers was very high; an $R^2$ = .8091 suggests, as individuals, these officers were 81 percent consistent in making decisions. These data indicate the test subjects made more consistent decisions with replacement data as a monetary or redundant type than a nonmonetary type.

| Table 4.5 | | |
| --- | --- | --- |
| Paired t-Test Comparison for<br>Consistency of Decision Makers<br>(Level of Significance .05) | | |
| Replacement<br>Information<br>Type | Average<br>$R^2$ | Significantly<br>Different? |
| Nonmonetary<br>Monetary | .8091<br>.8462 | Yes |
| Nonmonetary<br>Monetary | .8091<br>.8230 | No |
| Monetary<br>Redundant | .8462<br>.8230 | Yes |

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The $R^2$ as a measure of consistency may only be applied to individuals; however, the magnitude of the arithmetic difference in the average $R^2$ and group $R^2$ does offer insight into the homogeneity of the officers' decision making policy. The average and group $R^2$ are presented in Table 4.6; even though no suitable statistical test exists to rigorously compare these values, by inspection one can observe the difference in the two values, and this difference suggests that these officers' decision making policies are highly divergent. That is, the relative importance placed upon each factor in the decision making exercise varied between individual decision makers.

Table 4.6

Average Individual $R^2$ - Group $R^2$

| Replacement Information Type | Average $R^2$ | Group $R^2$ |
|---|---|---|
| Overall | .7723 | .3410 |
| Nonmonetary | .8091 | .3286 |
| Monetary | .8462 | .3546 |
| Redundant | .8230 | .3425 |

## Subjective/Objective Importance

As a final question, the decision makers were asked to indicate the relative importance they believed they placed upon each of the three promotion factors during the exercise. This was indicated by each person distributing 100 points to the three factors. Of the 166 surveys acceptable for the previous analysis, 5 were rejected because this question was completed incorrectly.

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The first analysis used the MANOVA subroutine of SPSS to compare the three subjective/objective importance measures for 1) all, 2) nonmonetary, 3) monetary, and 4) redundant decisions. In all cases the officers were not able to predict the weight they applied in completing the decision making exercise. As a further analysis, a paired t-test was performed on all thirty-six decisions and each of the twelve decisions by replacement information type, Table 4.7. The subjective values are the average of the estimates each decision maker indicated in completing the question. The objective values are the average of the relative importance values calculated through individual regression equations. In three instances the decision makers were successful at a significance level of .05 in predicting the relative importance they actually placed upon the data.

Table 4.7

Paired t-Test Comparing Subjective and
Objective Importance Placed upon Factors

| Subjective/ Objective | Assignment Level | Formal Education | Replacement Information |
|---|---|---|---|
| Subjective All Decisions | .4173 .3607 | .3291 .3851 | .2536* .2543* |
| Subjective Nonmonetary | .4173 .3748 | .3291 .3969 | .2536* .2283* |
| Subjective Monetary | .4173 .3729 | .3291 .3825 | .2536* .2446* |
| Subjective Redundant | .4173 .3501 | .3291 .3630 | .2536 .2869 |

*No Difference at Significance Level .05

This concludes the summary of the research results. Further discussion and specific conclusions relating to these results are contained in the next chapter.

## V.  Summary and Conclusions

The decision to promote an officer in the Air Force is a critical decision.  The Air Force, unlike private enterprise, acquires its senior officers entirely through promotions from within the organization, and since the number of senior officers (majors, lieutenant colonels, and colonels) are limited by law, the Air Force wishes to only promote the most highly qualified officers.

In this thesis the promotion to major has been used in the question- naire design.  This focus was emphasized for two reasons:  1) once an officer is promoted to major he will generally remain in the service for a minimum of twenty years, and 2) officers not selected for promotion to major are forced to separate from the service.  The first reason is critical because through the promotion process the Air Force selects the future senior decision makers--thereby affecting the quality of the Air Force.  The second reason results in direct monetary replacement costs for the Air Force.  These costs are in the form of severance pay to the separated officer and acquisi- tion costs of his replacement.  These latter "costs" are in the form of recruiting and training costs, and the lack of a trained person during the acquisition and training time.

The decision to promote a captain to major is reached by a board of Air Force colonels.  They review each eligible officer's personnel record, and based upon the information contained in these records, a decision is made to promote or to not promote the officer.  A selection decision be- comes particularly difficult in circumstances in which only a portion of a group of homogeneous eligibles (all having apparently the same qualifications

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and potential) may be promoted. The board realizes some of these officers can not be promoted because of congressionally imposed manning level restrictions. If we were to assume all these officers were equal in potential benefit to the Air Force, the most cost effective decision to the Air Force would be to promote those individuals that will cost the most to replace. This action would result in minimizing the replacement costs.

If a measure were developed that incorporated an estimate of the future contribution plus the cost of replacement of an officer, it could be used by promotion boards in reaching decisions. Such a measure would aid in selecting the most qualified officers for promotion, and simultaneously help minimize replacement costs to the Air Force. This development of human valuation concepts is an area known as human resource accounting (HRA).

The purpose of this thesis was to investigate how senior officers (colonels that are eligible to serve on major's promotion boards) react to two forms of human valuation information. Measurement of this reaction was accomplished through the distribution of a decision-making exercise in which colonels were asked to rate the promotability of hypothetical Air Force captains. In the exercise, each colonel was asked to make thirty-six ratings. These decisions were made up of three sets of twelve decisions; each set of twelve decisions were identical in all aspects but one --the replacement information. Two forms of replacement information were presented--conventional (nonmonetary) and HRA (monetary). These forms were presented singly and combined into three, twelve decision sets. This resulted in three types of replacement information. Within the thirty-six decisions, the arrangement by decision type was random.

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## Summary of Research Results

The research methodology utilized an instrument with questions conforming to a full-factorial design. Three types of replacement data were presented--nonmonetary (months of training), monetary (cost of training), and a redundant type (combined months and cost to train). In addition to the replacement information, assignment history and formal education were supplied as cues to the decision makers. Based upon a presentation of these cues, the colonels rated the promotability of the officer.

Hypothesis Testing. The twelve decisions of each replacement information type were processed with the SPSS MANOVA routine. Comparisons were calculated to determine if different decisions were made with the different types of replacement information. The MANOVA runs were made in pairs: 1) the nonmonetary and monetary types, 2) nonmonetary and redundant types, and 3) monetary and redundant types of decisions. The results indicated significantly different decisions had been made in comparisons one and three.

A samples paired t-test was run on the standardized beta weights to compare the weight placed upon types of replacement information. In the t-test, comparisons were made in the weight applied to the 1) nonmonetary versus monetary types, 2) nonmonetary versus redundant types, and 3) monetary versus redundant types of replacement information. The results indicated significantly different weights had been applied in runs one and two.

Data Correlation. A Pearson correlation was run to determine if there were any relationship between the weight an individual placed upon the monetary form of the replacement information and his demographic data

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(personal background data such as education level). These results indicated a significant positive correlation between monetary replacement data and highest level of assignment ever held by the individual. The correlation results also suggested a positive relationship (significance .08) between the monetary replacement information and the individual's job experience (yes/no) requiring accounting, financial management, cost analysis, or economic analysis.

Importance of Factors. The Hoffman (1960) relative importance averages for the three promotion factors were presented by each replacement information type. The average importance varied by the type of replacement information, but the approximate importance placed upon each factor in reaching a decision was 37 percent on level of assignment, 38 percent on formal education, and 25 percent on replacement information.

Decision Making Consistency. The average individual $R^2$ was reported and compared with a paired t-test to determine if significantly more consistent decisions were made with the different types of replacement information. The results do indicate statistically more consistent decisions were made with the monetary data than with the nonmonetary or the redundant types of the data. Group regression equations were calculated and presented for the combined (all thirty-six decisions together) and individual (each twelve decisions) types of the data. While the group $R^2$ values do not imply consistency of the individuals as a group, the difference in average individual $R^2$ and group $R^2$ suggest a diversity in the decision making policies of the decision makers. That is, individually they made consistent decisions, but the difference in group $R^2$ (.3410) and their

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average individual $R^2$ ( .7723) implies there is a wide variety in the relative importance these individuals placed upon the three factors. An alternative description--their decision making policies were not homogeneous.

Subjective/Objective Importance. Two analyses were performed on the subjective and objective importance placed upon the promotion factors. First, a MANOVA analysis was run to determine if there was an overall significant difference in the subjective and objective importance placed upon each factor. The results for each replacement information type were the same--the officers were not successful in predicting the weight they had placed upon each of the factors.

The second analysis was a paired t-test comparing the subjective and objective importance placed upon the factors. No significant difference was found in three of the twelve comparisons; all three were related to monetary information. In the exercise, as an average, the decision makers believed they had placed more weight on assignment history than they actually did, less on formal education than they actually did, and for replacement information the results were mixed.

## Conclusions and Findings of Hypothesis Tests

H1: Senior Air Force officers will make different promotion decisions when provided HRA information in a monetary form than when provided HRA information in a nonmonetary form.

The MANOVA results support this hypothesis; the officers did make significantly different decisions. These results suggest HRA data in a monetary form could affect the decisions made by Air Force promotion boards.

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H2:  Senior Air Force officers will make different promotion
decisions when provided HRA information in both a monetary and
nonmonetary form (i.e., redundant information) than when provided
HRA information in either solely a monetary form or solely a non-
monetary form.

The MANOVA results on this hypothesis were mixed.  The officers did
make significantly different decisions when HRA information was presented
as a redundant type versus a monetary type, but they did not make a statis-
tically different decision when the data was presented in a nonmonetary
versus redundant type.

These results imply if monetary HRA replacement information were
supplied versus a redundant type of replacement information, a different
promotability decision would be made.  However, if the conventional non-
monetary data were available and a redundant form were supplied, the re-
sulting decision would not be significantly different.  These results
suggest a preference for an explicit, single measure--nonmonetary or mone-
tary rather than a redundant type.

H3:  Senior Air Force officers will place a greater weight
upon HRA information in a monetary form than upon HRA information
in a nonmonetary form in reaching promotion decisions.

The results of the paired t-test support this hypothesis.  The indi-
viduals placed a statistically greater weight on the monetary data than on
the nonmonetary data.  This result suggests data in a monetary form com-
municates more information to a decision maker.

H4:  Senior Air Force officers will place a greater weight
upon HRA information in both a monetary and nonmonetary form (i.e.,
redundant information) than upon HRA information in either solely
a monetary form or solely a nonmonetary form in reaching their
decisions.

These results are mixed.  A statistically greater weight was not placed upon the redundant versus the monetary form, but the second half of the hypothesis could be accepted.  These results imply the decision maker did not differentiate between the monetary and redundant data types, they both conveyed the same information.  It would appear the decision maker seeing the monetary form of information in the redundant data ignored the nonmonetary portion of the data.

## Further Implications of the Results

The correlation results indicate a significant positive relationship between the weight placed upon the monetary factor and the highest level of assignment the individual has had.  This would suggest, individuals who are associated with higher level assignments are more sensitive to costs and their effect on the Air Force.  There were implications in the findings of a positive relationship between experience in a job requiring economic cost analysis and sensitivity to personnel replacement costs.  These two results in conjunction suggest a method to make officers more sensitive to costs--the Air Force could place the officer in high level assignments and place them in jobs requiring some type of cost analysis.

The results of the average importance data suggests these officers did not consider the replacement information to be the most important factor in this analysis; however, with an average relative importance of approximately 25 percent, it did have an impact upon decisions.  If replacement information were provided to a promotion board, this level of importance would not be expected because many more factors are available to promotion boards.  For additional insight, consult Glenn's (1977) findings and

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weightings on more conventional promotion factors. He employed a full-factorial design instrument in which he used professional military education, assignment history, aeronautical rating, OER ratings, and formal education as promotion factors.

The monetary data had an additional unexpected effect on the average decision-making consistency, $R^2$. With the monetary data type, the officers made significantly more consistent decisions than they did with the two other types of replacement data. This suggests more consistent decisions could be made if monetary HRA data were supplied to Air Force decision makers.

Comparison of the average individual $R^2$ values with the group $R^2$ values indicates there is great diversity in the importance decision makers place upon the factors presented in this questionnaire. These results suggest in a large group of decision makers one should not expect the group of persons to be homogeneous, rather each has his own opinions of what is important.

The results of the subjective and objective importance comparisons suggest decision makers are not very successful at predicting the weight they place upon criteria when they make decisions. These results suggest if Air Force officers do not accurately apply their perceived decision policy to a simulated promotion, then they, in fact, could not accurately apply a specific Air Force importance weighting policy if they were directed to do so. This implication has support in independent studies conducted by Harrell (1977) and Glenn (1977).

In this study, the form of the replacement information was shown to significantly (p .05)

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a. affect promotability rating rendered by Air Force colonels.

b. affect the weight placed upon replacement information.

c. correlate with the highest level of assignment of the colonels.

d. affect the consistency of the decision making.

These results suggest the introduction of monetary HRA data to the promotion selection system could have a significant effect upon promotion decisions.

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APPENDIX A

DECISION-MAKING EXERCISE

A DECISION-MAKING EXERCISE

FOR

AIR FORCE SENIOR OFFICERS

THIS IS NOT A QUESTIONNAIRE. It is a decision-making exercise designed for senior Air Force officers. It investigates how individuals such as yourself arrive at certain decisions. The entire exercise takes about fifteen minutes to complete. You will not be identified in the final report (a master's thesis at the Air Force Institute of Technology).

The decision making exercise used in this study is not designed to replicate the Air Force promotion board process. The ground rules for decision making that are used in this exercise differ substantially from those used during an Air Force promotion board. This is an academic study that investigates certain human information processing issues related to the Human Resource Accounting literature and the results of this study may not be generalized towards an Air Force promotion board.

If you would like to receive information about your decision-making behavior and how it compares with that of your contemporaries, please print your name and address in the space provided below. A short summary will be mailed to you, in confidence, after completion of the study (September 1978).

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

USAF SCN 78-122
Expires 22 September 1978

## PRIVACY STATEMENT

In accordance with AFR 12-35, paragraph 30, the following information is provided as required by the Privacy Act of 1974:

    a.  Authority

        (1)  5 U.S.C. 301, <u>Departmental Regulations</u>:  And/or

        (2)  10 U.S.C. 80-12, <u>Secretary of the Air Force, Powers and Duties, Delegation by</u>.

    b.  Principal purposes.  The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or Department of Defense.

    c.  Routine uses.  The survey data will be converted to information for use in research of management related problems.  Results of the research, based on the data provided, will be included in a written master's thesis and may also be included in published articles, reports, or texts.  Distribution of the results of the research, based on the survey data, whether in written form or orally presented, will be unlimited.

    d.  Participation in this survey is entirely voluntary.

    e.  No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

## BACKGROUND INFORMATION

Please circle the most appropriate answer for each of the following questions.

A. What is the highest level of assignment you have had during your Air Force career?

1. Wing
2. Division
3. Numbered AF Headquarters

4. Major Air Command Headquarters
5. USAF Headquarters
6. Other (specify)_____

B. What level of formal education have you completed?

1. Less than bachelor's degree
2. Bachelor's degree
3. Master's degree

4. Doctorate degree
5. Other (specify)_____

C. Indicate the largest number of people you have ever had under your supervision or command.

1. Less than 30
2. At least 30 but less than 50
3. At least 50 but less than 100

4. At least 100 but less than 250
5. At least 250 but less than 500
6. 500 or more.

D. Has your training or educational background included courses in accounting, financial management, cost analysis, or economic analysis?

1. Yes                    2. No

E. Have you ever had any job experience that required you to perform accounting, financial management, cost analysis, or economic analysis duties?

1. Yes                    2. No

The decision to promote, or not to promote, an officer to the rank of major is one of the most important personnel decisions within the Air Force. The decision-making exercise presented here asks you to judge the promotability of a number of hypothetical captains to the rank of major — under difficult decision-making circumstances. The cases presented involve officers who have exactly the same Officer Effectiveness Report histories. The OER ratings received by these officers are high enough that <u>some definitely should be promoted</u> to meet Air Force needs, but low enough that <u>some cannot be promoted</u> because of officer field grade limitations. Some of those not selected may be subject to involuntary separation or retirement. All are nonrated officers and all have completed the Squadron Officer School course in residence. You should, in fact, <u>assume these officers to be exactly alike in all respects except the three areas described below</u>, in which certain information is provided to you.

- A. **ASSIGNMENT HISTORY** — Each individual will have either served entirely at the base level or will have completed a headquarters level assignment.

- B. **FORMAL EDUCATION** — Each individual will have either earned a bachelor's or a master's degree.

- C. **REPLACEMENT INFORMATION** — Each individual involved has received special training within the Air Force and those who are not promoted <u>must be replaced</u> by individuals who must undergo similar training. In each case, you will be provided information which indicates either (1) the length of this training, (2) the dollar cost of this training, or (3) both the length of the training and its dollar cost. The three examples to be used are shown below:

| Length of Training Program | Cost of Training Program |
|---|---|
| 10 Months. . . . . . . . . . . . . . . . | .$30,000 |
| 20 Months. . . . . . . . . . . . . . . . | .$60,000 |
| 30 Months. . . . . . . . . . . . . . . . | .$90,000 |

Each decision case is presented in the following format:

### CAPTAIN #0

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | (Specific information |
| FORMAL EDUCATION | will be provided for each |
| REPLACEMENT INFORMATION | of these three factors.) |

### RATE THE PROMOTABILITY OF THIS OFFICER:

```
1.....2.....3.....4.....5.....6.....7.....8.....9
LOW              MODERATE              HIGH
```

You should <u>circle</u> the number that reflects your judgment of the promotability of each hypothetical captain. Make your decisions one at a time. Do not change a decision once you have made it. Work at a brisk pace, but do not hurry your decisions. Complete every case, as each is different.

## CAPTAIN #1

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Entirely at Base Level |
| FORMAL EDUCATION | Bachelor's Degree |
| REPLACEMENT INFO | $30,000 |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2....3....4....5....6....7....8....9
LOW           MODERATE           HIGH
```

## CAPTAIN #2

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Headquarters Tour Completed |
| FORMAL EDUCATION | Bachelor's Degree |
| REPLACEMENT INFO | 10 Months |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2....3....4....5....6....7....8....9
LOW           MODERATE           HIGH
```

## CAPTAIN #3

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Entirely at Base Level |
| FORMAL EDUCATION | Master's Degree |
| REPLACEMENT INFO | $60,000 |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2....3....4....5....6....7....8....9
LOW           MODERATE           HIGH
```

## CAPTAIN #4

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Headquarters Tour Completed |
| FORMAL EDUCATION | Master's Degree |
| REPLACEMENT INFO | 30 Months, $90,000 |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2....3....4....5....6....7....8....9
LOW           MODERATE           HIGH
```

## CAPTAIN #5

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Entirely at Base Level |
| FORMAL EDUCATION | Bachelor's Degree |
| REPLACEMENT INFO | 30 Months, $90,000 |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2...3....4....5...6....7....8....9
LOW           MODERATE           HIGH
```

## CAPTAIN #6

| DECISION CRITERIA | INDIVIDUAL DATA |
|---|---|
| AERO RATING | Not Rated |
| PME HISTORY | SOS Completed in Residence |
| ASSIGNMENT HISTORY | Headquarters Tour Completed |
| FORMAL EDUCATION | Master's Degree |
| REPLACEMENT INFO | 20 Months |

RATE THE PROMOTABILITY OF THIS OFFICER

```
1....2...3....4....5...6....7....8....9
LOW           MODERATE           HIGH
```

NOTE:  Pages 5 through 9 of the decision exercise have been omitted from this appendix.  These pages contain the other combinations of the three cues and, therefore, represent hypothetical captains 7 through 36.

## LAST TASK

Please indicate the relative importance that you believe you placed upon each of the following three factors during the exercise by distributing 100 points to these criteria. The most important factor should receive the most points, etc.

| CRITERIA | ASSIGNED POINTS |
|---|---|
| ASSIGNMENT HISTORY | _____ |
| FORMAL EDUCATION | _____ |
| REPLACEMENT INFORMATION | _____ |
| | |
| TOTAL POINTS | <u>100</u> |

THANK YOU FOR YOUR COOPERATION. SHOULD YOU DESIRE TO HAVE AN ANALYSIS OF YOUR INDIVIDUAL DECISION-MAKING BEHAVIOR MAILED TO YOU, PLEASE FILL IN YOUR NAME AND ADDRESS IN THE SPACE PROVIDED ON PAGE 1.

APPENDIX B

FREQUENCIES OF DEMOGRAPHIC DATA

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FILE    NONAME    (CREATION DATE = 08/02/78 )


D1        AST LVL

| CATEGORY LABEL | CODE | ABSOLUTE FREQUENCY | RELATIVE FREQUENCY (PERCENT) | ADJUSTED FREQUENCY (PERCENT) | CUMULATIVE ADJ FREQ (PERCENT) |
|---|---|---|---|---|---|
| WING | 1 | 4 | 2.4 | 2.4 | 2.4 |
| NO AF HQ | 3 | 6 | 3.6 | 3.6 | 6.0 |
| MAJCOM HQ | 4 | 53 | 31.9 | 31.9 | 38.0 |
| USAF HQ | 5 | 75 | 45.2 | 45.2 | 83.1 |
| OTHER | 6 | 28 | 15.9 | 16.9 | 100.0 |
| TOTAL | | 166 | 100.0 | 100.0 | |

VALID CASES    156        MISSING CASES    0

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FILE    NONAME    (CREATION DATE = 08/02/78 )

D2        ED LVL

| CATEGORY LABEL | CODE | ABSOLUTE FREQUENCY | RELATIVE FREQUENCY (PERCENT) | ADJUSTED FREQUENCY (PERCENT) | CUMULATIVE ADJ FREQ (PERCENT) |
|---|---|---|---|---|---|
| LT BACH | 1 | 10 | 6.0 | 6.0 | 6.0 |
| BACH | 2 | 42 | 25.3 | 25.3 | 31.3 |
| MASTER | 3 | 102 | 61.4 | 61.4 | 92.8 |
| DOCTORATE | 4 | 8 | 4.8 | 4.8 | 97.6 |
| OTHER | 5 | 4 | 2.4 | 2.4 | 100.0 |
| | TOTAL | 166 | 100.0 | 100.0 | |

VALID CASES    166        MISSING CASES        0

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FILE    NONAME    (CREATION DATE = 08/02/78 )

D3          NO. SUPR

| CATEGORY LABEL | CODE | ABSOLUTE FREQUENCY | RELATIVE FREQUENCY (PERCENT) | ADJUSTED FREQUENCY (PERCENT) | CUMULATIVE ADJ FREQ (PERCENT) |
|---|---|---|---|---|---|
| LT 30 | 1 | 12 | 7.2 | 7.2 | 7.2 |
| 30-50 | 2 | 5 | 3.0 | 3.0 | 10.2 |
| 50-100 | 3 | 12 | 7.2 | 7.2 | 17.5 |
| 100-250 | 4 | 34 | 20.5 | 20.5 | 38.0 |
| 250-500 | 5 | 33 | 19.9 | 19.9 | 57.8 |
| GT 500 | 6 | 70 | 42.2 | 42.2 | 100.0 |
| | TOTAL | 166 | 100.0 | 100.0 | |

VALID CASES    156    MISSING CASES    0

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FILE    NONAME    (CREATION DATE = 08/02/78 )

D4        TRNG

| CATEGORY LABEL | CODE | ABSOLUTE FREQUENCY | RELATIVE FREQUENCY (PERCENT) | ADJUSTED FREQUENCY (PERCENT) | CUMULATIVE ADJ FREQ (PERCENT) |
|---|---|---|---|---|---|
| YES | 1 | 112 | 67.5 | 67.5 | 67.5 |
| NO | 2 | 54 | 32.5 | 32.5 | 100.0 |
| | TOTAL | 166 | 100.0 | 100.0 | |

VALID CASES    166    MISSING CASES    0

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FREQUENCIES OF THE DEMOGRAPHICS FOR KLICK THESIS DATA

FILE    NONAME    (CREATION DATE = 08/02/78 )

D5        EXP

| CATEGORY LABEL | CODE | ABSOLUTE FREQUENCY | RELATIVE FREQUENCY (PERCENT) | ADJUSTED FREQUENCY (PERCENT) | CUMULATIVE ADJ FREQ (PERCENT) |
|---|---|---|---|---|---|
| YES | 1 | 122 | 73.5 | 73.5 | 73.5 |
| NO | 2 | 44 | 26.5 | 26.5 | 100.0 |
| | TOTAL | 166 | 100.0 | 100.0 | |

VALID CASES    156    MISSING CASES    0

APPENDIX C

EXAMPLE OF FEEDBACK PROVIDED
TO EXERCISE RESPONDENTS

SCHOOL OF ENGINEERING
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

TO:                                           20 SEPTEMBER 1978

THANK YOU FOR PARTICIPATING IN THE RECENT DECISION
ANALYSIS EXERCISE.  YOU REQUESTED AN ANALYSIS OF YOUR PER-
FORMANCE IN THAT EXERCISE.  THE FOLLOWING STATISTICS LIST
1) YOUR PROMOTABILITY DECISIONS BY REPLACEMENT INFORMATION
TYPES (NONMONETARY, MONETARY, AND REDUNDANT) AND 2) THE
AVERAGE PROMOTABILITY DECISIONS MADE BY OTHER AIR FORCE
COLONELS QUESTIONED IN THIS EXERCISE.  THE "OVERALL"
DESCRIPTOR IS ALL 36 DECISIONS TOGETHER, AND THE REMAINING
"NONMONETARY," "MONETARY," AND "REDUNDANT" DESCRIBE EACH
SET OF 12 DECISIONS WITH THOSE RESPECTIVE TYPES OF REPLACE-
MENT INFORMATION.  THE "SUBJECTIVE IMPORTANCE" IS THE IMPOR-
TANCE YOU BELIEVE YOU PLACED UPON EACH PROMOTION FACTOR
DURING THE COMPLETION OF THIS EXERCISE.  THE CONSISTENCY
MEASURE INDICATES, IN EACH DECISION-MAKING CONTEXT, THE
CONSISTENCY WITH WHICH THE "OBJECTIVE IMPORTANCE" POLICY
WAS APPLIED IN REACHING DECISIONS.

## OBJECTIVE IMPORTANCE
## YOUR RESULTS

| REPLACEMENT INFORMATION TYPE | ASSIGNMENT HISTORY | FORMAL EDUCATION | REPLACEMENT INFORMATION | CONSISTENCY OF DECISIONS |
|---|---|---|---|---|
| OVERALL | 2% | 0% | 98% | 58% |
| NONMONETARY | 1% | 0% | 99% | 94% |
| MONETARY | 3% | 0% | 97% | 94% |
| REDUNDANT | 3% | 0% | 97% | 83% |

## SUBJECTIVE IMPORTANCE PLACED
## UPON PROMOTION FACTORS

| ASSIGNMENT HISTORY | FORMAL EDUCATION | REPLACEMENT INFORMATION |
|---|---|---|
| 15% | 5% | 80% |

## OBJECTIVE IMPORTANCE
## AVERAGE RESULTS FOR 166 AIR FORCE COLONELS

| REPLACEMENT INFORMATION TYPE | ASSIGNMENT HISTORY | FORMAL EDUCATION | REPLACEMENT INFORMATION | CONSISTENCY OF DECISIONS |
|---|---|---|---|---|
| OVERALL | 36% | 39% | 25% | 77% |
| NONMONETARY | 38% | 40% | 22% | 81% |
| MONETARY | 38% | 38% | 24% | 85% |
| REDUNDANT | 35% | 37% | 28% | 82% |

THANK YOU AGAIN FOR YOUR COOPERATION IN THIS RESEARCH EFFORT.

CAPTAIN HAROLD E. KLICK
AFIT/ENS
WRIGHT-PATTERSON AFB, OH    45433

## Vita

Harold E. Klick was born in Bastrop, Louisiana on March 13, 1944, the son of Otto Klick and Octavia Keahey Klick. He completed high school in Bastrop, Louisiana in 1962, and in 1968 received his B.S. in Electrical Engineering (Computer Option) from Louisiana Polytechnic University in Ruston, Louisiana. February 3, 1969 he entered the United States Air Force and was commissioned through the Officer Training School. In June 1977 he began classes at the Air Force Institute of Technology seeking a Masters of Science degree in Systems Management. He has previously served at the National Security Agency, Fort George G. Meade, Maryland, Rome Air Development Center, Griffiss Air Force Base, Rome, New York. Following graduation, Captain Klick will be assigned to the Foreign Technology Division, Wright-Patterson Air Force Base, Ohio.


      Permanent Address:    Route 3, Box 150
                                 Bastrop, Louisiana   71220

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

| REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM |
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| 4. TITLE *(and Subtitle)*<br>THE IMPACT OF HRA INFORMATION ON THE<br>PROMOTION TO MAJOR | | 5. TYPE OF REPORT & PERIOD COVERED<br>MS |
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Director of Information

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Officer Promotions, promotion; HRA, Human Resource Accounting; judgment
analysis, decision making, policy capturing, personnel evaluation.

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

In this research the policy-capturing model was employed to investigate the reaction of Air Force colonels to different forms of personnel replacement information. The investigation was structured as a promotability rating decision in which each officer was asked to rate thirty-six hypothetical captains for promotion to major. These thirty-six decisions were composed of three sets of twelve decisions, identical in all aspects, but for a changing factor described as the cost of replacing a separated officer--or replacement information. The replacement information was in two forms--nonmonetary and monetary. These data forms were structured in three ways: 1) nonmonetary alone, 2) monetary alone, and 3) nonmonetary combined with monetary (redundant).

These decisions were structured into a questionnaire of a full-factorial design. In addition to replacement information two additional factors were supplied as decision cues--assignment history and education level. A group of Air Force colonels was randomly selected as test subjects, and the questionnaires were distributed by first-class mail. Data collected from these colonels were used to test research hypotheses, and the findings indicate the form of the replacement information (nonmonetary versus monetary) affects the promotability rating rendered by these officers. Also, the importance placed upon the replacement information is affected by its form, and the weight placed upon the monetary form of the replacement information is positively correlated with the highest level of assignment held by the individual. The data form of the replacement information affects the consistency of the officer's decision making. Additionally, the findings show the officers were not successful in predicting the importance they actually placed upon each factor in completing the questionnaire. Finally the data indicated the officer's decision making policies were not homogeneous; they used a wide variety of decision policies in completing the questionnaire.